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ABSTRACT

This paper proposes an approach to diagnosing learning disabilities that measures the intrinsic processing or capacity weaknesses that are presumed to underlie academic performance problems. This approach is contrasted with the "diagnosis by exclusion" method currently used. The paper discusses: (1) a definition of intrinsic processes with distinctions between them and other kinds of mental processes; (2) evidence for intrinsic processing weaknesses as the cause of specific learning disabilities; (3) advantages of a processing approach to diagnosis over current discrepancy-based approaches; (4) difficulties involved in using direct assessment of intrinsic processes to diagnose learning disabilities; (5) alternatives to classification based on assessment of intrinsic processes; and (6) threats to the concept of specific learning disabilities at the levels of science and educational practice arising from a decision to eschew the assessment of intrinsic processes as part of classification procedures. The paper also addresses the consequences for the field of learning disabilities of changing the procedures for classifying these children. (DB)

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EMPIRICAL AND THEORETICAL SUPPORT FOR DIRECT DIAGNOSIS OF LEARNING DISABILITIES BY ASSESSMENT OF INTRINSIC PROCESSING WEAKNESSES

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EXECUTIVE SUMMARY

Introduction

The term *learning disabilities* has traditionally referred to problems that students experience in acquiring academic knowledge and skills that are caused by disorders in basic psychological processes that, in turn, are caused by dysfunction of the central nervous system (USOE, 1977). In the case of *specific learning disabilities*, these processing weaknesses are thought to have a strictly limited impact on cognitive development. They impede the child's acquisition of certain academic skills, although many other cognitive abilities develop normally. The central question addressed in this paper is whether the field currently has sufficient scientific knowledge to recommend that schools identify children with learning disabilities by directly measuring intrinsic processing disabilities. At present, children are identified as learning disabled by methods that attempt to rule out other potential causes of learning problems such as low general intelligence, lack of opportunity to learn, and sensory or emotional impairment. Current dissatisfaction with this approach arises from a variety of theoretical issues and empirical findings that undermine its validity as a means for reliably identifying all children who have learning difficulties resulting from intrinsic processing weaknesses (Fletcher et al., 1998; Siegel, 1989; Stanovich, 1991).

The alternative approach evaluated in this paper involves directly diagnosing learning disabilities by measuring the "intrinsic" processing or capacity weaknesses that are presumed to

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underlie the academic performance problems shown by these children. The assessment of intrinsic processing weaknesses is not included as part of the operational criteria for the diagnosis of learning disabilities in current regulations because there has been little consensus about what these deficient processes are or how to measure them (Hammill, 1990). During the two decades since the original regulations were written, enormous advances have occurred in our scientific understanding of learning disabilities. Thus, it is important to consider whether we now have sufficient knowledge to shift away from "diagnosis by exclusion" and to directly diagnose learning disabilities by assessing intrinsic processing weaknesses directly.

Findings

The paper provides information relevant to this question in six sections:

1. A definition of intrinsic processes with distinctions between them and other kinds of mental processes
2. Evidence for intrinsic processing weaknesses as the cause of specific learning disabilities
3. Advantages of a processing approach to diagnosis over current discrepancy-based approaches
4. Difficulties involved in using direct assessment of intrinsic processes to diagnose learning disabilities.
5. Alternatives to classification based on assessment of intrinsic processes
6. Threats to the concept of specific learning disabilities at the levels of science and educational practice arising from a decision to eschew the assessment of intrinsic processes as part of classification procedures

The last two sections are described in the concluding part of the executive summary.

What Is Meant By the Term "Intrinsic Processing" Weaknesses?

Although intrinsic processing weaknesses can be identified at several different levels, the most productive level on which to search for "intrinsic" processing weaknesses in children with learning disabilities is the psychological or neuropsychological level. At this level, it is possible to identify processing capacities and skills that can be linked to neuro-biological differences, but that are also potentially measurable outside a medical or biological laboratory. At the psychological level, processes are defined as sequences of specific covert behaviors that transform and manipulate information between the time it enters as a stimulus and the time a response to it is selected and executed. These processing descriptions are an intermediate level of explanation between outcomes, such as difficulty in acquiring an automatic recall of math facts or difficulties in using phonemic decoding skills in reading, and their biological underpinnings. The most likely candidates for the kind of "intrinsic processing weaknesses" that are referred to in definitions of learning disabilities are domain-specific processing capabilities that arise relatively early in development and are usually executed automatically.

Evidence for Intrinsic Processing Weaknesses as the Cause of Specific Learning Disabilities

While there is ample evidence that intrinsic processing weaknesses can cause learning disabilities, it remains very difficult to assess these processing weaknesses reliably outside the psychological laboratory. For example, in the case of phonologically based reading disabilities, the tasks most commonly used to predict and diagnose reading disabilities are not direct measures of the processing weaknesses fundamental to the disorder. There is still considerable debate about the nature of the processing weakness that makes it difficult for some children to acquire phonemic awareness, but it is clear that deficient phonemic awareness itself is an *outcome* of both experiential and processing weaknesses, and not an "intrinsic processing weakness" in the sense referred to in most definitions of learning disabilities. In the case of nonverbal learning disabilities, evidence for causal relationships between the specific

neuropsychological problems identified in the syndrome and the academic outcomes associated with the syndrome is still relatively weak.

Advantages of a Processing Approach to Diagnosis over Current Discrepancy-Based Approaches

Direct diagnosis of the processing weaknesses of children with learning disabilities has three important advantages over IQ-discrepancy, or diagnosis-by-exclusion approaches. First, a processing approach to diagnosis would not require children to endure failure in school prior to the diagnosis. Second, direct assessment of processing weaknesses would allow instruction to be targeted on all children who have common learning problems, not just on those who satisfy an arbitrary discrepancy criterion. Finally, the identification of intrinsic processing weaknesses has the potential to focus instruction in areas of greatest need.

Difficulties in Implementing a Diagnosis Based on Direct Assessment of Intrinsic Processing Weaknesses

Two very difficult problems severely limit the viability of approaches to diagnosing learning disabilities that depend on identifying intrinsic or constitutionally based psychological processing weaknesses. The first problem is that we do not have a complete understanding of the psychological processing capabilities that are required to attain good learning outcomes in all the areas specified in the definition and regulations. The second problem is that it is difficult to know for certain whether performance problems on psychological tests reflect intrinsic processing limitations or whether performance is limited by deficits in acquired knowledge structures and acquired automatic processing routines. Although we now have good evidence that current definitions of learning disabilities are valid for many children, the foundation for a reliable and valid assessment of the intrinsic psychological processing weaknesses of children with learning disabilities is not strong enough to recommend it for widespread application in schools.

Conclusion

The concluding sections of the paper discussed a classification model that does not depend on direct assessment of intrinsic processing weaknesses, but that does share all of the advantages of such an approach. Potential threats to the field of learning disabilities associated with the adoption of new diagnostic approaches are also discussed from both an applied and scientific viewpoint.

Alternatives to Classification Based on Assessment of Intrinsic Processes

The classification model being recommended in this paper is a two-stage, or two-tier, model that combines the assessment of predictor variables with careful and continuous monitoring of children's response to early and subsequent interventions. Initially, children in first grade, kindergarten, or even preschool would be identified for special preventive instruction under learning disabilities regulations if they performed below criteria on predictors of specific academic achievement and were not mentally retarded. Any child not classified with some other primary disability (e.g., mental retardation, visual handicap) who was achieving below criteria on predictors for "at risk" status would be eligible for services. The predictor variables used in this classification strategy would not necessarily be "intrinsic" processing limitations, but could be early outcomes from such processing limitations, such as weaknesses in phonemic awareness or difficulties acquiring a knowledge of letter-sound correspondences.

Children would not be assigned the formal label of "learning disabled" until later in elementary school (perhaps grade 3 or later). After receiving several years of special preventive instruction, a child could be certified as learning disabled if he or she continued to experience severe difficulties with any of the academic skills specified in the definition and regulations and attained a score on a measure of general learning ability above a given level. Any child with

continuing severe academic difficulties who was not classified with some other primary disability would be considered learning disabled for purposes of instruction and accommodation.

Potential Threats to Concepts and Practices from the Proposed Diagnostic Approach

Changing the procedures for classifying children with learning disabilities in the manner suggested in this paper would have several consequences for the field of learning disabilities. First, the children identified for learning disabilities services in the school would become more heterogeneous with regard to level of general intelligence. This result would require a more differentiated approach to providing accommodations than is presently the case. Second, children identified as "at risk for learning disabilities" on the basis of their performance on process and outcome measures would also more likely come from minority ethnic groups and homes of lower socioeconomic status. This would be the case because almost all variables that predict level of academic outcomes are influenced both by early learning opportunities in the environment and by constitutionally based, "intrinsic" processing weaknesses. Finally, unless service delivery capacity were substantially increased, many children now receiving learning disabilities services would no longer receive them. The system currently does not have the capacity to serve *all* children who do not have another primary disability but whose learning difficulties in specific academic areas are severe enough to interfere with their ability to accomplish grade-level work.

Potentially, the changes could positively affect the scientific study of learning disabilities by forcing investigators to more carefully define their samples and to select them in more principled ways. A major negative impact might arise from a loss of identity for the field if it divides into separate groups, each focusing on different kinds of learning difficulties.